PEACE/WILLISTON
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COMPENSATION
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BC hydro

BRITISH
COLUMBIA

A Reconnaissance Survey of Unnamed Lake (Sylvester Lake East)

M. J. Hunter
March 1997

PWFWCP Report No. 144

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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105-02896/

A RECONNAISSANCE SURVEY OF

UNNAMED LAKE (SYLVESTER LAKE EAST)

WATERSHED:	**Williston Reservoir (Parsnip Reach)**
DATE OF SURVEY:	**July 10, 1996**
FIELD CREW LEADER:	**Mark Hunter**
FIELD ASSISTANT:	**Karin Mathias**
REPORT PREPARED BY:	**Mark Hunter**

BRITISH COLUMBIA CONSERVATION FOUNDATION

PEACE / WILLISTON FISH AND WILDLIFE COMPENSATION PROGRAM

B. C. MINISTRY OF ENVIRONMENT, LANDS AND PARKS

FUNDED BY: FOREST RENEWAL BRITISH COLUMBIA

RELEASED BY: _____

D. J. Cadden, Regional Fisheries Biologist

LAKE: Unnamed Lake (Sylvester East) SYSTEM NAME: Nation River

A.S.A.P. REFERENCE NO.: WATERSHED CODE: 237-3310-617-201

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved 02 / Temp. Profiles	X
Physical Data	X	Winter Dissolved 02 / Temp. Profiles	--
Bench Mark	X	Netting Record	X
Terrain Features	X	Lake Catch Summary	X
Access	X	Individual Fish Data	--
Resorts and Campsites	X	Fish Preserved	--
Other Developments	X	Stomach Analysis	--
Obstructions and Pollutions	X	Scale Reading	--
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices	
Miscellaneous Comments	X	A: Water Chemistry Analysis	X
Lake Drainage	X	B: Tributary Stream Data	X
Fisheries Management Comments	X	C: Fish Scale Analysis	--
History of Previous Surveys	X	Bathymetric Map Reduction	X
Water Chemistry Summary	X	Bathymetric Map	--

LOCATION

Location:	approximately 85 km west of Mackenzie		
Elevation:	1125 m ± 25 m	U.T.M.:	10.409159.6129533
Latitude / Longitude:	55°18'14" 124°25'52"	N.T.S. Map No.:	93 - N / 8
Management Unit:	7-28	Biogeoclimatic Zone:	Engleman Spruce - Sub-Alpine Fir
Ecoprovince:	Sub-Boreal Interior	Ecoregion:	Omineca Mountains
Ecosection:	Manson Plateau		

Drainage: Unnamed C. --> Unnamed Pond

PHYSICAL DATA

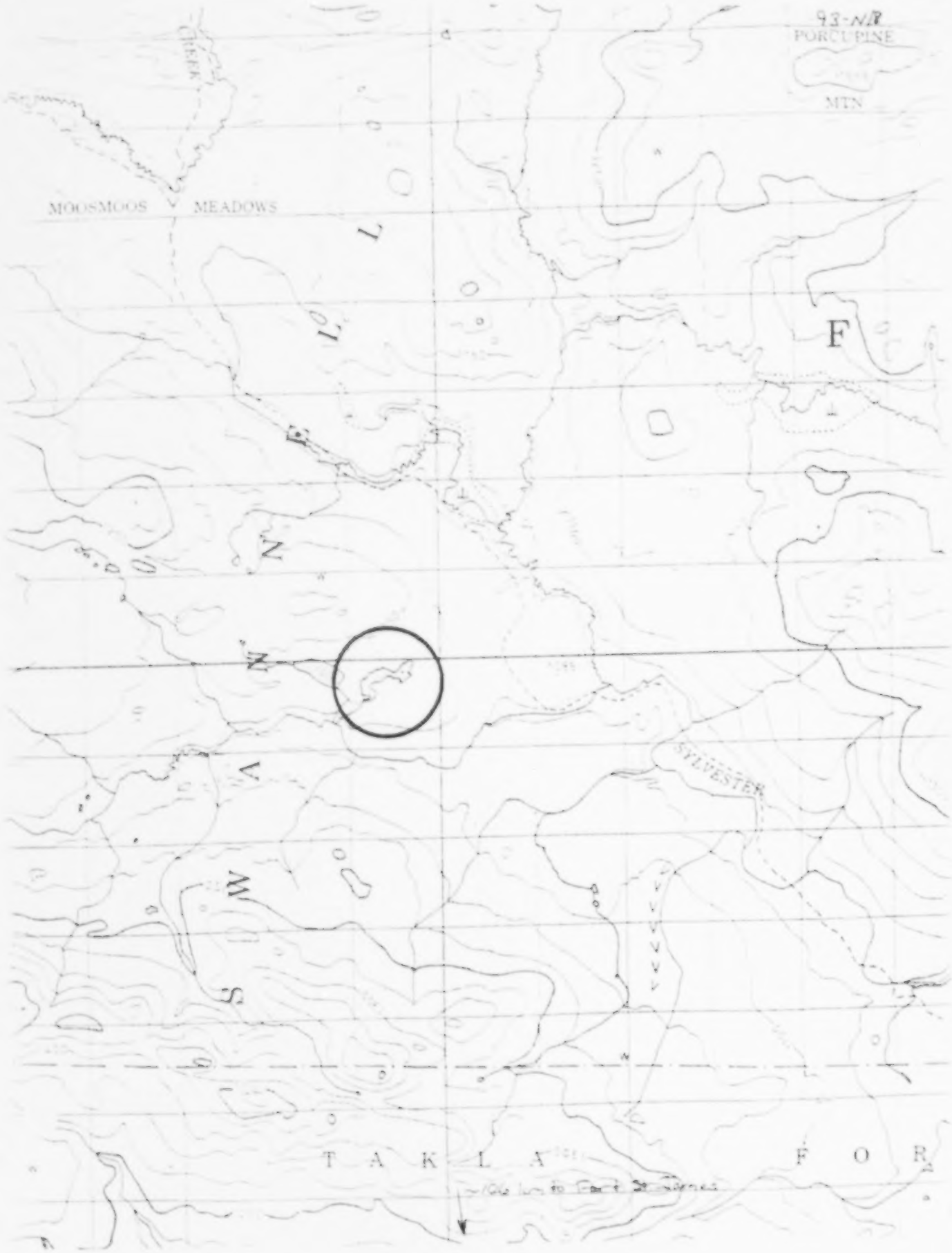
Lake Drainage Area:	1.6 km^2	Volume:	36 050 m^3
Water Surface Area:	37 648 m^2	Perimeter of Islands:	0 m
Area Above 6 m Contour:	37 648 m^2	Number of Islands:	0
Shoreline Perimeter:	1 531 m	Mean Depth:	1.0 m
Maximum Depth:	3.1 m	Secchi Reading:	3.1 m
Filterable Residue (TDS):	30 mg/L		

Sounding Device: Lowrance X-15 Elevation Source: Contour Interpolation

BENCHMARK

(Iron spike, center of red circle) located 2.0 m above present water level in a 35 cm diameter lodgepole pine tree that is 3.5 m from the present water's edge and located on the north shore of the west bay approximately 130 m west of Intermittent Inlet # I (Plate # 5).

High Water Mark: 0.8 m above water level at time of survey


93-N/8
PORCUPINE
MTN
MOOSMOOS
MEADOWS
F
SYLVESTER
T A K L A
F O R

LAKE: Unnamed Lake (Sylvester Lake East)

TERRAIN FEATURES

Immediate Shoreline:

Sylvester Lake East is fronted on almost all sides by a sedge grass growth with some alder and scrub birch. The exceptions are in the swamp areas, which are in the west corner, middle of the north shore, a small one on the northwest shore and around the outlet creek on the south shore; in these locations the lake is fronted by sedge grasses with willows and alders growing behind. Around the rest of the lake, lodgepole pine, spruce and fir trees grow behind the sedge grass, alder and scrub birch front, with common juniper and pink mountain heather frequently mixed in among the trees. The land away from the lake's edge has a moderately steep slope to the north and south. To the west, the land slopes steeply away. There is a low slope to the land in all of the swamp areas, and in the northeast corner of the lake. On the southeast shore of the east bay, there is a bedrock outcropping that has a vertical slope.

The lake's substrate on all sides of the lake is silt and organics with a large amount of large woody debris fallen into the lake. In the small southwest bay, there is so much large woody debris that it is impossible to take a motor boat under power into there. The lake bottom drops slowly off towards the middle of Sylvester Lake East.

Surrounding Country:

Sylvester Lake East is surrounded by a mature forest of lodgepole pine, spruce and fir trees growing on rolling hills. An unnamed lake (Sylvester Lake West) lies approximately 0.25 km to the west of Sylvester Lake East. A small pond is found approximately 0.035 km to the south of the lake that is fed by the outlet creek. Mountains can be seen in the distance to the south. Sylvester Lake East is situated within the Engleman Spruce - Sub-Alpine Fir biogeoclimatic zone.

LAKE: Unnamed Lake (Sylvester Lake East)

ACCESS

Directions:

From the junction of Highway 27, the Teardrop Forest Service Road and the Germansen Landing North Road, drive north on the Germansen Landing North Road for approximately 100 km, then continue north on the Thutade Forest Service Road for approximately 14 km. Turn left onto the Sylvester Main Line, and drive for approximately 10.5 km. Turn left again onto a logging road, and travel for approximately 3 km to the second clear cut. From this clear cut, Sylvester Lake East is approximately a 4 km helicopter ride to the northwest.

Road Type and Conditions:

The Germansen Landing North road and the Thutade Forest Service Road are both well-maintained, two-lane gravel roads that are easily accessible with two-wheel drive vehicles. The Sylvester Main Line is rough in some places, but can be traveled with a two-wheel drive truck. The logging road is very rough in some places, and a four-wheel drive vehicle is recommended for crossing some of the cross ditches in the road.

Restrictions:

None known.

RESORTS AND CAMPSITES

There are no resorts or campsites on Sylvester Lake East.

OTHER DEVELOPMENTS

None noted.

OBSTRUCTIONS AND POLLUTIONS

None noted.

LAKE: Unnamed Lake (Sylvester Lake East)

SPECIAL RESTRICTIONS

None known.

AQUATIC PLANTS

The following aquatic plants were identified during the time of the survey:

Equisetum sp.
waterweed (Anacharis sp.)
sedge grasses

WILDLIFE OBSERVATIONS

The following wildlife or signs were seen during the time of the survey:

golden-eye drake and hen with 8 ducklings
cow moose and moose droppings and tracks
squirrel
frogs
various songbirds
unidentified gulls

MISCELLANEOUS COMMENTS

1) Lots of caddis flies, damsel flies, may flies, Chaoborus and chironomids were seen on 1 in the water. As well, the water column was full of Chlorella colonies.

2) The outlet creek drains Sylvester Lake East to the east, not to the south as shown on the N.T.S. maps. It is possible that during times of high water, the inlet creek may back up and there may be some sub-surface flow to the south of the lake over the forest floor.

3) A Forest Recreation Site could easily be built along the west shore of Sylvester Lake East on top of the hill that could provide access to both of the lakes.

4) Bathymetric map: The lake outline was drawn from an enlargement of air photo 30 BCB 94065: No. 100, flown August 27, 1994.

LAKE: Unnamed Lake (Sylvester Lake East)

LAKE DRAINAGE

General:

Sylvester Lake East is fed by one inlet creek that enters the lake from the west. The lake is drained to the south by an unnamed creek that flows approximately 0.035 m into a small pond that is a bowl of land and has no outlet.

Major Systems:

There are no major systems.

Minor Systems:

Inlet # 1 - Unnamed Creek

The inlet creek enters Sylvester Lake East from the west (Plate # 6). Approximately 660 m upstream from the lake, the channel goes underground for 6 m. Approximately 685 m upstream, the channel braids into two, both of which go underground for 2.5 m before they resurface. At the point where it resurfaces, the large cobble and boulders that were present disappear and the substrate is comprised of only fines, gravels and small cobble. Approximately 700 m upstream from the lake, a pine tree has fallen across the channel that may hinder or block fish passage. Approximately 800 m upstream from Sylvester Lake East, the creek drains an Unnamed Lake (Sylvester Lake East). The channel is heavily overgrown with alders over the first two-thirds of it's length.

A Stream Survey card was completed for a sample site located approximately 630 m upstream from the lake (Plates # 7 - # 8). The average wetted width is 0.6 m and the average maximum riffle depth is 0.2 m. The substrate is comprised of fines (50%), cobbles (35%) and boulders (15%). The creek morphology is mainly riffles (45%) and runs (45%) with some pools (10%). Although there is no good spawning habitat in the sample site, there are some patches of gravels in other parts of the outlet creek. For additional information, refer to Appendix B.

Outlet - Unnamed Creek

The outlet creek drains Sylvester Lake East to the south, and flows approximately 35 m before it empties into a small unnamed pond (Plate # 9). The pond is approximately 35 m long and 25 m wide, and is situated in a bowl of land. The pond has no outlet (Plates # 10 & # 11). Lots of large woody debris has fallen into the pond. A high water mark of 1.0 m was found. The creek has an average wetted width of 1.0 m and depth of 0.1 m. The outlet had no fisheries potential during the survey period.

LAKE: Unnamed Lake (Sylvester Lake East)

FISHERIES MANAGEMENT COMMENTS

Sylvester Lake East is an ideal lake for stocking due to the apparent absence of any fish species in the lake, and that other than the Unnamed Lake (Sylvester Lake West) it is connected to by the inlet creek, it is in a closed system. As well, Sylvester Lake East has enough vegetation and aquatic plants that it should be able to provide enough food to maintain a population of fish. Numerous caddis flies, damsel flies, may flies, Chaoborus and chironomids were seen in addition to some Gammerus. Also, numerous colonies of Chlorella were seen throughout the water column. This system of two lakes may be good lakes for an Arctic grayling transplant. If Arctic grayling were to be transplanted to Sylvester Lake East, they could be caught from the nearby Nation River so that there is no chance of contaminating the natural stock. If the lake was to be stocked, some work done on the Inlet Creek would provide good spawning habitat to make the lake self-sufficient with regards to maintaining a fish population. Removing the sections of land under which the inlet creek flows would ensure access to all parts of the creek. The placement of some spawning gravel would ensure that spawning would be possible. Before any stocking is done, a winter oxygen / temperature profile should be completed to ensure that the lake does not experience winter-kill conditions.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

None known.

Other Related Studies:

None known.

LAKE: Unnamed Lake (Sylvester Lake East)

WATER CHEMISTRY SUMMARY **Limnology Station No. 1**

Field Conditions:

Date:	July 10, 1996		
Time:	1210 hrs	Air Temperature:	15 °C
Wind Velocity:	10 - 15 km/h	Wind Direction:	from the SW
Cloud Cover:	6 / 10 o.c.	Surface Conditions:	light ripple
Secchi Disc:	3.1 m	Water Colour:	yellow / brown

Method Used:

Dissolved Oxygen:	YSI Model 57 Oxygen / Temperature Meter
Water Temperature:	YSI Model 57 Oxygen / Temperature Meter
Air Temperature:	Hand-Held Alcohol Thermometer
pH (field):	Digital pH Pocket Tester
H2S (field):	Hach H2S Field Test Kit
Laboratory Used:	Pacific Environmental Science Center
Water Sampler:	Vertical Alpha Water Bottle (Vandorn)
Metal Sampler:	By Hand; Preserved With 2.0 mL Nitric Acid
Substrate Sampler:	Substrate Sample Not Taken

Water Sample Chemistry: SEAM **Site** No.: E 223172

	Sampling Depths	
	Surface (0.5 m)	Lower (2.0 m)
Alkalinity (lab)	10.7 mg / L	10.5 mg / L
Filterable Residue 105°C (lab)	30 mg / L	30 mg /L
H2S (field)	N/A	0mg / L
Nitrogen - Total (lab)	0.37 mg / L	0.35 mg / L
Non-Filterable Residue (lab)	< 5 mg / L	< 5 mg / L
pH (field)	7.0	7.1
pH (lab)	6.99	6.96
Phosphorus - Total Dissolved (lab)	0.01 mg / L	0.014 mg / L
Specific Conductance (lab)	31 uS / cm	30 uS / cm

Bottom Depth: 3.1 m

Substrate Sample Depth: N/A

* additional analyzed parameters and results, including metals, are found in Appendix 1

LAKE: Unnamed Lake (Sylvester Lake East)

SUMMER OXYGEN / TEMPERATURE DATA

DEPTH (m)	02 (mg/L)	TEMPERATURE (°C)
Surface	8.3	15.1
0.5	8.2	15.1
1.0	8.1	15.0
1.5	8.1	14.5
2.0	8.9	13.1
2.5	7.8	11.0
3.1	Bottom	

SUMMER OXYGEN / TEMPERATURE PROFILE

LAKE: Unnamed Lake (Sylvester Lake East)

NETTING RECORD

Mesh Size Experimental Order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE # 1

Type:	Sinking Monofilament Gill Net			
Date Set:	July 10, 1996		Time:	1125 hrs
Date Lifted:	July 10, 1996		Time:	1625 hrs
Net Dimensions:	Length:	91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm		Depth:	1.0 m
			Substrate:	silts / organics
Deep End Mesh Size:	64 mm		Depth:	2.0 m
			Substrate:	fines / organics

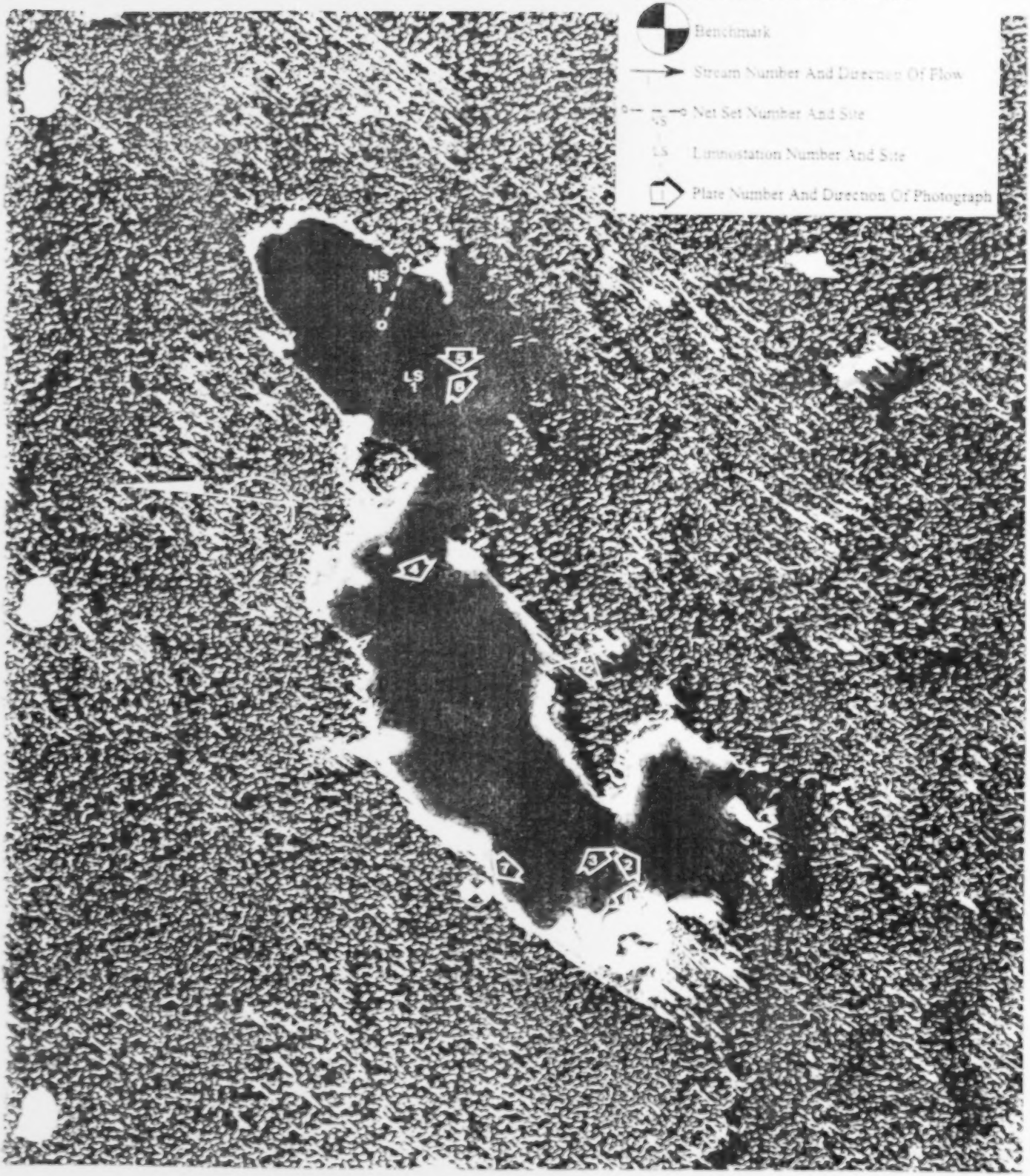
Comments: The net was empty.

LAKE CATCH SUMMARY

Minnow Traps:

Bait: Sardines

Trap No.	Hours	Depth (m)	Substrate	Species	No. Caught	Size Range (cm)
1	4:52	0.8	silt / organics	empty	0	-
2	4:51	0.7	silt / organics	leech	1	-
3	4:51	0.6	silt / organics	leech	1	-


LOCATION OF INVENTORY SITES
Benchmark
Stream Number And Direction Of Flow
Net Set Number And Site
LS Luminostation Number And Site
Plate Number And Direction Of Photograph
NS 1
LS 1
5
6
4
7
3
2

LAKE: Unnamed Lake (Sylvester Lake East)

Plate	Roll : Number	Description
1	5: 8	Aerial view of Unnamed Lake (Sylvester Lake East) looking southwest. Note Unnamed Lake (Sylvester Lake West) in the background.
2	4: 5 - 7	Panoramic view of Unnamed Lake (Sylvester Lake East) looking northeast from the southwest end of the lake.
3	5: 21, 24	Panoramic view of Unnamed Lake (Sylvester Lake East) looking southwest from the middle of the lake.
4	5: 17, 18, 20	Panoramic view of Unnamed Lake (Sylvester Lake East) looking northeast from the southwest end of the northeast bay.
5	5: 11	View of the benchmark located 2.0 m above present water level in a 35 cm diameter Lodgepole pine tree that is 3.5 m from the present water's edge and located on the north shore of the west bay approximately 130 m west of the Intermittent Inlet # 1.
6	4: 1	View of the mouth of Inlet # 1 where it enters Unnamed Lake (Sylvester Lake East) on the southwest end of the lake.
7	4: 18	Upstream view of the sample site on Inlet # 1, taken approximately 630 m upstream of Unnamed Lake (Sylvester Lake East).
8	4: 20	Downstream view of the sample site on Inlet # 1, taken approximately 640 m upstream of Unnamed Lake (Sylvester Lake East).
9	5: 13	Upstream view of the outlet, taken approximately 30 downstream of the lake. Note Unnamed Lake (Sylvester Lake East) in the background.
10	5: 14	View of the pond, looking southwest, that the outlet flows into, taken approximately 35 m downstream of Unnamed Lake (Sylvester Lake East).
11	5: 15	View of the pond, looking east, that the outlet flows into, taken approximately 35 m downstream of Unnamed Lake (Sylvester Lake East).

LAKE: Unnamed Lake (Sylvester Lake East)

Plate # 1: Aerial view of Unnamed Lake (Sylvester Lake East) looking southwest. Note Unnamed Lake (Sylvester Lake West) in the background.

LAKE: Unnamed Lake (Sylvester Lake East)

Plate # 2: Panoramic view of Unnamed Lake (Sylvester Lake East) looking northeast from the southwest end of the lake.

LAKE: Unnamed Lake (Sylvester Lake East)

Plate # 3: Panoramic view of Unnamed Lake (Sylvester Lake East) looking southwest from the middle of the lake.

LAKE: Unnamed Lake (Sylvester Lake East)

Plate # 4: Panoramic view of Unnamed Lake (Sylvester Lake East) looking northeast from the southwest end of the northeast bay.

Plate # 5: View of the benchmark located 2.0 m above present water level in a 35 cm diameter Lodgepole pine tree that is 3.5 m form the present water's edge and located on the north shore of the west bay approximately 130 m west of Intermittent Inlet # 1.

Plate # 6: View of the mouth of Inlet # I where it enters Unnamed Lake (Sylvester Lake East) on the southwest end of the lake.

Plate # 7: Upstream view of the sample site on Inlet # 1, taken approximately 630 m upstream of Unnamed Lake (Sylvester Lake East).

Plate # 8: Downstream view of the sample site on Inlet # 1, taken approximately 640 m upstream of Unnamed Lake (Sylvester Lake East).

Plate # 9: Upstream view of the outlet, taken approximately 30 m downstream of the lake. Note Unnamed Lake (Sylvester Lake East) in the background.

Plate # 10: View of the pond, looking southwest, that the outlet flows into, taken approximately 35 m downstream of Unnamed Lake (Sylvester Lake East).

LAKE: Unnamed Lake (Sylvester Lake East)

Plate # 11: View of the pond, looking east, that the outlet flows into, taken approximately 35 m downstream of Unnamed Lake (Sylvester Lake East).

Appendix A

LABORATORY REPORT

Water Chemistry Analysis

RESULTS FOR UNNAMED LK-SYLVESTER E.LK E223172 SAMPLES

Parameter Analyzed		Units	96/07/10 0.5M 962932-001	96/07/10 2.0M 962932-002
ALKALINITY		mg/l	10.7	10.5
CONDUCTIVITY		uS/cm	31	30
METALS/TOTAL (WATER-ICP)	AG	mg/l	<.01	-
	AL	mg/l	.1	-
	AS	mg/l	<.06	-
	B	mg/l	<.01	-
	BA	mg/l	<.001	-
	BE	mg/l	<.001	-
	CA	mg/l	4.3	-
	CD	mg/l	<.006	-
	CO	mg/l	<.006	-
	CR	mg/l	.013	-
	CU	mg/l	<.006	-
	FE	mg/l	.1	-
	K	mg/l	.1	-
	MG	mg/l	1	-
	MN	mg/l	.004	-
	MO	mg/l	<.01	-
	NA	mg/l	.5	-
	NI	mg/l	<.02	-
	P	mg/l	<.1	-
	PB	mg/l	<.06	-
	SB	mg/l	<.06	-
	SE	mg/l	<.06	-
	SI	mg/l	1.5	-
	SN	mg/l	<.06	-
	SR	mg/l	.011	-
	TI	mg/l	<.002	-
	V	mg/l	<.01	-
	ZN	mg/l	<.002	-
NITROGEN/AMMONIA		mg/l	.008	.011
/NITRITE		mg/l	.002	.002
/NITRITE+NITRATE		mg/l	.002	.002
/TOTAL		mg/l	.37	.35
PH		Rel.U.	6.99	6.96
PHOSPHORUS/O-PO4		mg/l	.001	<.001
/TOTAL		mg/l	.023	.019
/TOTAL DISSOLVED		mg/l	.01	.014
RESIDUE/FILTERABLE		mg/l	30	30
/NON-FILTERABLE		mg/l	<5	<5

Appendix B

Tributary Stream Data

D.F.O. / M.O.E. Stream Survey Form

DFO - MOE

STREAM SURVEY FORM

Stream Name

Watershed Code

Location

Date

PARAMETER

OBSTRUCTIONS

Ave Chan Width (m)

Ave Wet Width (m)

Ave Max Pool Depth (m)

Gradient %

Pool

Side Chan %

Area %

Count

EMBEDDED MATERIAL

Fines

Gravel

Cobbles

Boulders

Bedrock

BANKS

FISH SUMMARY

Species

Life Phase

Method

Ref

STREAM VALLEY CROSS-SECTION

PLANIMETRIC VIEW

COMMENTS

Appendix C

BATHYMETRIC MAP

Reduced to
34%
of Original Size

Unnamed Sylvester Lake East